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PATENT APPLN. NO. 10/525,092
RESPONSE UNDER 37 C.F.R. § 1.116

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REMARKS

The Office has maintained the rejections of the claims as being unpatentable over the prior art that were made in the Office Action dated December 21, 2007. These rejections are:

(1) Claims 1, 5-11, 13, 15, 16, 19, 20, 21, 23 and 26-31 under 35 U.S.C. 103(a) over Nishimura (JP 2001-131827) in view of Tan (WO 02/12395; U.S. Patent No. 6,710,135 used as English equivalent) and in further view of Kondo (U.S. Patent No. 5,593,778) and Zeitler (U.S. Patent No. 5,811,508);

(2) Claims 1, 5-11, 13, 15, 16, 19, 20, 21, 23 and 26-31 under 35 U.S.C. 103(a) over Obuchi (U.S. Patent No. 6,417,294) in view of Tan and further in view of Kondo and Zeitler;

(3) Claims 13, 15, 24 and 25 under 35 U.S.C. 103(a) over Nishimura, Tan, Zeitler and Kondo or Obuchi, Tan, Zeitler and Kondo, in further view of Anderson (U.S. Patent No. 4,009,513); and

(4) Claims 12, 14, 17, 18 and 22 under 35 U.S.C. 103(a) over Nishimura, Tan, Zeitler and Kondo or Obuchi, Tan, Zeitler and Kondo in view of Yamakita (U.S. Patent Publication No. 2003/0079297).

The basic position of the Office in each of these rejections is the same. The position of the Office is that it would have been obvious to a person of ordinary skill in the art to modify

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Nishimura and Obuchi to produce fibers from the compositions disclosed therein by melt spinning because Tan allegedly teaches melt spinning to be functionally equivalent to tape yarn production, to modify the fiber resulting from the combination of Nishimura and Tan and the combination of Obuchi and Tan to have a fineness of 5-55 dtex because Kondo teaches that thinner fibers increase the softness of the resulting article, and to use a carboxyl equivalent of less than 10 meq to form a fiber of superior hydrolysis resistance.

Applicants submit that the Office has not supported a case of prima facie obviousness of the claims of the application and that, when the teachings of the cited prior art as a whole are considered, a person of ordinary skill in the art would not have had a reasonable expectation that fibers having a fineness of 0.1-10 dtex could be successfully produced from the compositions of Nishimura and Obuchi by melt spinning.

In the Final Action the Office states "[i]t is unclear why one would not have a reasonable expectation to form the composition of Nishimura or Obuchi into a lower dtex fiber." (Final Action, page 4, lines 1-3).

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This is not a precise statement of the issue raised by each of the rejections. The issue is whether a person of ordinary skill in the art would have had a reasonable expectation of forming the composition of Nishimura or Obuchi into a lower dtex fiber having good properties by melt spinning or, stated differently, whether a person of ordinary skill in the art would have had a reasonable expectation of success of forming the composition of Nishimura or Obuchi into a lower dtex fiber by melt spinning. Producing lower dtex fibers having poor properties is not the reasonable expectation of success required under 35 U.S.C. 103(a) and applicant's claims are limited to melt spinning.

The reasons why a person of ordinary skill in the art would not have had a reasonable expectation of success of forming the composition of Nishimura or Obuchi into a lower dtex fiber by melt spinning are, first, Nishimura itself discloses that good results will not be obtained. (See paragraph of [0013] of Nishimura. There is no basis for a conclusion that a person skilled in the art would have reasonably expected good results when the prior art discloses that good results will not be obtained.

Second, the Office has not demonstrated that a person of ordinary skill in the art would reasonably expect the use of melt

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spinning to be equivalent to tape yarn production using the compositions of Nishimura and Obuchi. (It is noted that the Office has the initial burden of supporting a case of prima facie obviousness and, thus, showing such expected equivalency).

The Office relies on Tan for such expected equivalency. However, the compositions of Tan are not the same compositions as disclosed in Nishimura and Obuchi and the Office has not explained why the results obtained using the different compositions of Tan containing an unspecified lubricant would be reasonably expected to apply to the compositions of Nishimura and Obuchi.

Third, melt-spun fibers and flat yarn have different properties and a person of ordinary skill in the art could not reasonably expect all compositions that can be formed into a flat (tape) yarn to be capable of being melt-spun. The differences between melt-spun and flat yarns is explained below.

Melt-spun fibers have a cross-sectional shape surrounded by a convexly curved line, whereas the cross-sectional shape of flat yarns is such as being defined by parallel rectilinear lines and is similar to a film having a certain thickness. Therefore, when it is contacted with another object, a melt-spun fiber undergoes point-contact, while a flat yarn has face-contact. Accompanying

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such face-contact, stress tends to concentrate along edges of a flat yarn, so that a flat yarn is prone to undergo fibrillation (longitudinal cracking). To prevent such phenomenon from occurring, it is a common practice in the art to add a lubricant called an anti-blocking agent to the compositions to be formed into flat yarns. The lubricants described in Nishimura and Obuchi come under the category of the above anti-blocking agents.

In contrast to the above, melt-spun fibers have a cross-sectional shape surrounded by a convexly curved line as noted above and are, accordingly, unlikely to undergo fibrillation. The melt-spun fiber according to the present invention is, moreover, ultra-fine, has a relatively large specific surface area and is prone to wear deterioration, so that wear resistance is strongly demanded of the fiber. The polylactic acid fibers according to the present invention are so fine as to have a single fiber fineness of 0.1 to 10 dtex. As yarn fineness is smaller, specific surface area is larger. For example, the specific surface area of a melt-spun fiber having a round cross-sectional shape and a single fiber fineness of 10 dtex is found by calculation to be so large as to be about 4.7 times the specific surface area of a 500 dtex flat yarn disclosed in Nishimura, assuming a thickness of 100 μm . According

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to the present invention, specific fatty acid amides are blended in fibers having a very large specific surface area as above and thereby an improvement is attained in or relating to the wear resistance.

As pointed out above, the fatty acid amides disclosed in or by Nishimura are antiblocking agents for obviating fibrillation of flat yarns, and therefore their function or activity is absolutely different from that of the specific fatty acid amides used in or for the present invention, i.e., to enhance the wear resistance in the case of fibers having an extremely small single fiber fineness.

In light of these differences, the art-skilled person, would not have had the necessary reasonable expectation of success of melt spinning the compositions of Nishimura and Obuchi to obtain fibers having a single fiber fineness of 0.1 to 10 dtex as required in the claims of the present application.

Fourth, the data of the 132 Declaration of Katsuhiko Mochizuki show that melt spinning is not functionally equivalent to tape yarn production using a preferred composition of Nishimura.

The Additional Comparative Examples 1-3 in Table 1 of the Declaration represent examples in which the polymer compositions in Examples 1-3 of Nishimura were spun to filaments having a mono-

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filament fineness of 5-50 d (5.5-55 dtex) as taught by Kondo, by the melt-spinning method taught by Tan.

The data of Table 1 of the Declaration show that the polylactic acid fibers obtained according to the Additional Comparative Examples 1-3 are poor in respect of the solidity to dry friction and solidity to wet friction and have poor wear resistance. To add to this, the Declaration also shows that the polylactic acid fibers obtained in the Additional Comparative Examples 1-3 are poor with respect further to the color tone (b* values), dyeing evenness, yarn breaks during spinning, draw superiority ratio and the halt of loom as well.

These data rebut the Office's case of prima facie obviousness.

Applicants note that the Office appears to be suggesting providing data showing unexpected results for other "specific fatty acid amides" in the method of the present invention as compared to fatty acid amides disclosed in Nishimura and Obuchi. A showing of unexpected results is not required because the Office has not supported a case of prima facie obviousness. Moreover, Nishimura and Obuchi do not disclose the method of the present invention and thus a comparison with fatty acid amides used in Nishimura and Obuchi is not relevant.

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In summary, the Office has not supported a case of prima facie obviousness. Removal of the 35 U.S.C. 103(a) grounds of rejection is in order and is respectfully solicited.

The foregoing is believed to be a complete and proper response to the Office Action dated May 15, 2008.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension and any additional required fees may be charged to Deposit Account No. 111833.

Respectfully submitted,
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